# NEWS REPORT

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# The Agricultural Research Institute

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ON November 23, 1953, approximately one hundred and twenty scientists from industrial, governmental, and educational institutions assembled at the National Academy of Sciences–National Research Council for the second annual meeting of the Agricultural Research Institute. Here biology, chemistry, engineering, medicine, and physics were being integrated with agronomy, animal husbandry, economics, genetics, horticulture, and meteorology with respect to research and the attainments of agriculture. Here was the opportunity for men from industry, government, and academic life to reach the understanding necessary for effective cooperation.

Two years ago, on December 10, 1951, at the instigation of R. C. Newton of Swift and Company and Paul D. V. Manning of the International Minerals and Chemical Corporation, the proposal to organize the Agricultural Research Institute was presented to a gathering of representative scientists from agricultural industries and research agencies. The purpose of the proposed organization was to provide a mechanism for the collaboration of industrial, governmental, and academic scientists in promoting agricultural research and practices aimed at the best longtime utilization of the Nation's agricultural resources. The plan proposed a dual arrangement whereby the Agricultural Research Institute would be a fiscal organization of dues-paying industries having a stake in agriculture and the Agricultural Board would be a deliberative group of scientists appointed by the National Research Council. Effective liaison with the Agricultural Board was to be accomplished through technical representatives of the dues-paying members and designation of non-dues-paying member representatives from scientific societies, federal agencies, state institutions, and other associations or individuals interested in agriculture.

The plan as conceived has now become a reality. Under the stimulus of the Institute, the Agricultural Board has been able to promote the activity of its current committees, to revive some of its dormant activities, and to consider the activation of new studies. The current activities in the field of animal nutrition, animal health, feed composition, and seed preservation are matters of record. Forthcoming developments to be activated by the Agricultural Board are in the fields of animal breeding, water conservation and utilization, range and pasture management, plant diseases and pests, farm machinery and mechanization, the competition between animal and vegetable fats and oils, and cooperative research in agriculture. The implementation of these studies by the Agricultural Board was prompted by suggestions from members of the Institute. These were consolidated into specific recommendations by

the Projects and Proposals Committee under the chairmanship of Roland Bethke of the Ralston-Purina Company.

In addition to providing a forum for discussion of the activities of the Agricultural Board, one of the major functions of the Agricultural Research Institute is to proffer the opportunity to review the major problem areas of agricultural research through addresses by leaders familiar with the broadest applications of agriculture to human welfare. Some of these areas are summarized in the following paragraphs.

George H. Hart, University of California, lucidly described the developmental potentials of the vast western rangelands which can be realized if proper concepts of plant and animal ecology are combined in a wise program of making the lands useful for mankind. Fire, water, and fertilizers were listed among the major factors which could contribute to this development. Dr. Hart emphasized the need for reconsideration of the current concept of carcass quality of meat animals in relation to genetics, feeding practices, and surplus fat. Infertility in cattle, hereditary defects, lethals, and dwarfism were pointed out as serious problems in animal production. Disease and pest control was discussed as a problem of wide biological implication where species competition, antibiotics, and chemicals have to be carefully adjusted to prevent detrimental imbalances.

A clear picture of the problem of utilizing the resources of fixed land areas in providing for an ever expanding population was presented by E. C. Stakman of the University of Minnesota. Land can be made more productive by provision of water, by development of plants requiring little water, by use of fertilizer, and by newer knowledge of soil microbiology and plant nutrition. The problem of plant disease and pest control was discussed with reference to disease resistance and biological or chemical control of pathogens. The maximum productive capacity of the principle agricultural crops is still an unknown quantity. The ultimate genetic capacity of the plant must be considered along with the ultimate carrying potential of the soil, and both must contend with the depredation of competitive biological systems.

J. Earl Coke, Assistant Secretary of Agriculture, presented the objectives of the reorganization of the United States Department of Agriculture, which would emphasize broadening the markets for agricultural produce at home and abroad, strengthening the research program, and decentralizing Government functions. The fact that one farm worker today provides for about fifteen people and by 1975 may have to provide for twenty-one was cited in support of pressure for cooperation in governmental and industrial research programs. The 17 percent increase in efficiency of food production between 1940 and 1950 resulting from research was estimated to have kept retail food prices from going higher than they did by 42 percent.

Speaking for the United States Department of Agriculture on the attainments of agricultural research, Byron Shaw noted the advances in agricultural productiveness since the establishment of the Department in 1862. He cited the cooperative development of the land-grant college system as it is working at present and recognized the need for closer cooperation with industrial research in a combined effort to meet the challenge of the future. The basic physical, biological, and economic science necessary to progressive agriculture must be continuously expanded, and concurrently the educational development of trained personnel for research and management of the resources available is essential.

James H. Hilton, President of Iowa State College, representing the land-grant colleges, defined agriculture as a basic industry responsible for supplying mankind with raw materials derived directly from the soil or indirectly by husbandry for food, clothing, and shelter. The land-grant college system in addition to contributing the necessary technology has helped to place the farmer in a respectful position with regard to investments of capital, labor, and intelligence comparable to that occupied by those in non-agricultural enterprises.

The industrial benefits resulting from research on agricultural products were discussed by Carl Miner, Director of the Miner Laboratories. He cited numerous instances of industries developed from primary agricultural produce and wastes. For

example, the development of a simplified pressing machine for local manufacture of building and insulating material from cornstalks was described as a possibility for cheap animal housing and barn insulation.

The atmosphere of interest engendered by these discussions indicated enthusiastic approval of the program developed by Dr. Manning. The general sentiment appeared to be that the Institute was here to stay and continuous growth of membership could be anticipated. The officers elected for 1954 are: Paul D. V. Manning, *President;* Berton S. Clark, American Can Company, *Vice President;* and Roland Bethke, *Secretary.*

The promise of the Institute lies in the evident willingness of its members to participate actively in making it become a cooperative endeavor for the application of objective scientific wisdom to the public welfare. Rather than a source of funds for research, the Agricultural Research Institute is a resource for the utilization of research results applicable to a beneficent agriculture.

# Military Problems in Elastomer Research

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THE word elastomer is defined as an elastic or rubber-like substance, specific examples of which are natural and synthetic rubber. Synthetic rubber research received great impetus during the war when most of our sources of natural rubber stocks were cut off by enemy action. The success of this government-sponsored program was evidenced by the tremendous postwar use of synthetic rubber in many applications where natural rubber had previously been used. Some of the synthetic rubbers or elastomers have found use in applications where natural rubber is not satisfactory, for example, in hoses for hydrocarbon fuels where natural rubber deteriorates when in contact with such substances.

Many of the military problems involving the use of elastomers are unique to military operations, and the solution of these problems cannot be found in civilian experience. Therefore, it is necessary for the military services to sponsor research and development projects directed toward solution of these problems.

Since 1943, the Quartermaster General has utilized the advisory services of the National Academy of Sciences–National Research Council for guidance in the placing of research and development contracts and in making the proper scientific approaches for solving research problems assigned to him. This function has been carried out by the Advisory Board on Quartermaster Research and Development and by technical committees organized by the Academy–Research Council to advise the Office of the Quartermaster General on the research and development program.

In 1949, the Quartermaster General was assigned primary responsibility for elastomer research for the Department of the Army. This responsibility, however, included only the materials aspects of the problem and specifically excluded end items utilizing elastomers.

One of the problems of particular concern to the military is the performance of equipment under arctic conditions. At sub-zero temperatures rubber and elasto-

mers become brittle, gaskets take a permanent set, and tires develop flat spots. Other organic materials, such as lubricating oils and hydraulic fluids, progressively solidify as the temperature becomes lower.

In response to a request from the Quartermaster General for advice in solving this vexing problem, a conference of fundamental scientists convened at the Shoreham Hotel in 1949 under the auspices of the Committee on Plastics and Elastomers with C. C. Price of the Department of Chemistry, Notre Dame University, as chairman. Recommendations from the conference outlining the fundamental problems to be solved and suggesting an approach toward solution of the arctic rubber problem were used as a basis for a research program conducted by the Office of the Quartermaster General. The recommendations from the conference were also made available to the other military services having an interest in elastomer research.

Our Armed Forces must be prepared to operate not only under arctic conditions but also under all conditions which may be encountered in any part of the world, and this includes the depths of the seas as well as the far reaches of the stratosphere.

As military technology advances, it becomes increasingly apparent that further advance will depend on the fruitfulness of researchers looking into the fundamental nature of things. Already in aeronautics the conquering of the "sound barrier" has been achieved with aircraft flying at speeds exceeding the speed of sound. For given conditions of air temperature and density, the sound barrier is fixed and no amount of aircraft design can change it. Its influence on the aircraft, however, can be minimized by design.

Unlike the sound barrier, the "heat barrier" resulting from air friction at high velocities can be moved, in effect, by providing materials which retain their properties at elevated temperatures. Intensive efforts are being made to improve thermal stability of metals, alloys, and ceramics for rigid and semirigid structural materials to meet the demands of more efficient power units, control surfaces, and other components of high speed aircraft. In the nuclear power field there are needs also for construction materials which retain their structural characteristics at high temperatures.

Along with the need for thermally stable rigid and semirigid structural materials is the need for hydraulic fluids, lubricating oils and greases, hoses, gaskets, belts, coatings, and a host of other items which will retain their design functions at temperatures as high as 600° F. As a consequence of the development of modern weapons, elastomers which will have functional serviceability at extremely high temperatures are urgently needed. For example, the observed effects of high temperatures generated by atomic blasts on protective garments of our ground and sea forces have demonstrated the need for elastomers stable at those temperatures.

In order to outline a research program to meet current needs and to anticipate future needs for thermally stable materials, particularly elastomers, a conference of scientists was convened on November 4, 1953, at the Shoreham Hotel under the auspices of the Subcommittee on Elastomers of the Committee on Plastics and Elastomers. C. C. Price again served as chairman of the High Temperature Elastomer Conference. The conference was preceded by a two-day symposium on High Temperature Organic and Semi-Organic Materials sponsored by and held at the National Bureau of Standards under the chairmanship of C. W. Beckett, Head of the Thermodynamics Section of the Bureau.

The Bureau of Standards symposium provided background information on the status of research in the field of high temperature organic and semi-organic materials of interest to the conference participants, many of whom had attended the symposium at the Bureau. It was shown that certain classes of compounds were more stable than others, and effort had been directed toward determining the reasons for the greater stability of these compounds. The classes of compounds included those with resonance-stabilized benzene rings directly joined or joined through atoms (or groups) capable of strong bonding resulting from resonance interaction with the phenyl groups. The effect of perfluorination in enhancing the stability of the carbon-carbon bond was noted, and it was observed that

the carbon-carbon bond dissociation energy in hexafluoroethane is 120 kilo calories per mole which is 40 kilo calories per mole higher than for ethane. Compounds with conjugated chains also were observed to have enhanced stability toward high temperatures.

It was emphasized that thermal stability of organic and semi-organic materials is related to the time of exposure at a given temperature. As the temperature rises, the rate of thermal decomposition increases.

With regard to elastomers, it was agreed that they should have a high polymer network structure having chains with low interchain forces, many equal energy configurations, and low barriers to rotation between different configurations. To serve at high temperatures, the basic polymer chain and the cross links must be thermally stable. High temperatures will promote rubber-like properties in polymer systems by overcoming interchain forces and barriers to rotation. One important guide to structural units likely to promote rubbery properties over a wide temperature range is knowledge of the temperature-viscosity relationships for prototype molecules. The most likely candidate structures will be those with minimum change in viscosity with temperature.

The mechanism of thermal degradation of polymers was discussed, and it was reported that there are two types of reaction involved. One is chain scission in which large molecules break into smaller polymer units, and the other involves an unraveling or zipper type of reaction in which monomer units are successively broken from the chain ends. The possibility of inhibiting these reactions by some means was discussed. Further discussion included consideration of the properties and structure of a number of rubber-like compounds which appear promising for high temperature applications.

There was general agreement among the conferees that, although solutions were in sight for rubber-like organic polymer materials for use at temperatures up to 600° F., extension to 800° F. or higher seemed unlikely for any organic materials now known. To meet future requirements for flexible materials useful at still higher temperatures requires new approaches, presumably substantially inorganic.

It is hoped that by acquainting the scientific public with the nature of fundamental problems involved in meeting certain military materials requirements, additional research effort may be inspired, especially in the universities.

# *SCIENCE NEWS*

### CONFERENCE ON MARITIME CARGO TRANSPORTATION

As an outgrowth of the Conference on Marine Cargo Handling and Transport held at the National Academy of Sciences in July 1952 (*see* NEWS REPORT, Vol. II, pp. 86–87), the Departments of Defense and Commerce requested the Academy–Research Council to organize the Maritime Cargo Transportation Conference. Initially this Conference, which in reality is a standing group, is being supported by a contract with the Office of Naval Research. The general objective of the Conference is to provide guidance on means and techniques for improving systems and system elements in the sea transportation of dry cargo and to determine critical factors and remedial measures to reduce current ship turnaround times, including total time in ports.

This project has been placed under the joint direction of the Division of Engineering and Industrial Research and the Division of Physical Sciences. A Board of Advisors, under the chairmanship of Vice Adm. E. L. Cochrane, U. S. Navy (ret.), has been appointed by the National Research Council and consists of top level representatives of industrial, governmental and academic research and development in

cargo handling and related fields. This Board will furnish guidance and review to a small professional staff provided to carry on the research.

The first meeting of the Board was held at the National Academy of Sciences on December 15, 1953. President Bronk welcomed the group and spoke briefly on Academy history and orientation. William W. Rubey, Chairman of the National Research Council, and Louis Jordan, Executive Secretary of the Division of Engineering and Industrial Research, explained the functions of the Research Council and its relationship to government. Other presentations covered the existing maritime dry cargo transportation situation and the numerous current efforts being made toward improvement in various phases of the problem.

The Board approved staff proposals on objectives, organization and procedures. An initial study of a typical transportation system is planned. Assistance will be requested as required from appropriate Research Council activities and associates. A steering committee and four technical advisory committees were appointed. The technical committees will deal with cargo, ship, port facilities, and internal clearance (railroads, trucking, inland waterways, etc.)

The members of the Board of Advisors are: Brig. Gen. F. S. Besson, Jr., U. S. Army; L. M. K. Boelter, University of California; Vice Adm. E. L. Cochrane, U. S. Navy (ret.), Massachusetts Institute of Technology; J. A. Crothers, Delaware River Port Authority; Vice Adm. F. C. Denebrink, U. S. Navy; Brig. Gen. J. P. Doyle, U. S. Air Force; Ivan D. Eby, Moore-McCormick Steamship Company; James A. Farrell, Jr., Farrell Lines, Inc.; Vice Adm. R. F. Good, U. S. Navy; Philip A. Hollar, Association of American Railroads; J. V. Lawrence, American Trucking Associations, Inc.; Rear Adm. W. D. Leggett, Jr., U. S. Navy; W. E. Maloney, American Merchant Marine Institute; Rear Adm. E. J. Moran, U. S. Naval Reserve, Moran Towing and Transportation Company; Richard Parkhurst, Mystic Terminal Company; Capt. O. W. Pearson, American President Lines; Rear Adm. J. R. Perry, U. S. Navy; L. S. Rothschild, Maritime Administration; Hartley Rowe, United Fruit Company; Rear Adm. M. L. Royar (SC), U. S. Navy; E. B. Smith, Department of Defense; D. D. Strohmeier, Bethlehem Steel Company; Chester Thompson, American Waterways Operators, Inc.; Andrew Warwick, T. Hogan and Sons, Inc.; Jay Weil, Jr., Gulf Shipside Storage Corporation; and Brig. Gen. R. H. Wylie, U. S. Army (ret.), Board of State Harbor Commissioners, San Francisco.

Currently the staff members are: Rear Adm. E. G. Fullinwider, U. S. Navy (ret.), *Director;* C. R. Denison, Maritime Administration; Col. Richard D. Meyer, U. S. Army; R. R. O'Neill, University of California; with Capt. Gordon R. Keating, U. S. Navy, as liaison with the Military Sea Transportation Service.

## APPOINTMENT IN DIVISION OF ENGINEERING AND INDUSTRIAL RESEARCH

Rear Adm. Edwin G. Fullinwider, U. S. Navy (ret.), has been appointed Assistant Executive Secretary of the Division of Engineering and Industrial Research to succeed Milton K. Akers, who has returned to his home in California.

Admiral Fullinwider came to the Academy–Research Council with experience in research administration gained from serving as Executive Officer of the Geophysical Laboratory of the Carnegie Institution of Washington. His Navy service included special training and responsible commands in ordnance and gunnery with tours of duty at the Naval Gun Factory and the Naval Powder Factory. During World War II, he planned and executed amphibious warfare assaults. His first major assignment with the Division of Engineering was to serve as Acting Director of the newly organized Maritime Cargo Handling Conference.

## TO ARRANGE OCEANOGRAPHIC CONVOCATION

At the request of the Office of Naval Research, the Division of Earth Sciences jointly with the Divisions of Physical Sciences and Biology and Agriculture, and sections of the Academy, will arrange for

an Oceanographic Convocation at Woods Hole, Mass., in May or June of this year. The convocation will constitute the scientific portion of a dedication program for the new Laboratory of Oceanography at Woods Hole. The committee arranging the convocation also will include representatives from the Woods Hole Oceanographic Institution, the Marine Biological Laboratory, and the U. S. Fish and Wildlife Service, all with facilities at Woods Hole. Publication of the proceedings is anticipated.

### ACADEMY–COUNCIL LECTURE SERIES

Distinguished scientists from Great Britain and the United States have lectured at the Academy–Research Council since the initiation of the lecture series this year. The speakers and the titles of their lectures are as follows:

November 4, "Aurora Polaris, Description and Theory," by Sydney Chapman, Professor of Geophysics at the University of Alaska and lately Sedleian Professor of Natural Philosophy at the University of Oxford, England.

November 24, "The Molecular Basis of Vision," by George Wald, Professor of Biology, Harvard University.

December 8, "Origin of the Earth's Magnetic Field," by Sir Edward C. Bullard, Director of the National Physical Laboratory, Teddington, England.

January 12, "The Elastic Transition of Muscle from Rest to Activity," by A. V. Hill, Honorary Research Associate, University College, London, and lately Foulerton Research Professor of the Royal Society.

January 26, "Energy and Food," by Warren Weaver, Director of the Division of Natural Sciences and Agriculture, the Rockefeller Foundation.

Professor J. Monod of the Pasteur Institute in Paris, a distinguished investigator in the field of microbiology, will speak on "Recent Developments in the Study of the Biosynthesis of Enzymes" on Tuesday, February 16. Professor Hans Adolf Krebs, Nobel Prize Winner in medicine and physiology in 1953 and professor of biochemistry at the University of Sheffield, England, has accepted an invitation to lecture in the series in late February or March.

### FOOD AND NUTRITION BOARD

In response to a request from the Commissioner of the Food and Drug Administration for advice on the problem of how to predict the effect of extensive use of artificial sweeteners in foods on the nutritional welfare of the public, the Food and Nutrition Board decided to initiate the following three-phase study: *1*) The Committee on Definitions and Standards of Identity for Foods will explore the possibility of forming representative industry groups to confer with Food and Drug officials on development of proposals for definitions and standards of identity for canned fruits sweetened with saccharin or sucaryl instead of sugar, dextrose and corn sirup, as now provided by standards. *2*) The Committee on Food Protection will evaluate the safety of sweeteners and the additives used in conjunction with them. *3*) A special committee to be appointed will study the policies which would serve to direct the use of artificially sweetened products in the best interests of the nutritional welfare of the public.

### COMMITTEE ON DRUG ADDICTION AND NARCOTICS

A symposium on laboratory and clinical methods for testing analgesic drugs was held by the Committee on Drug Addiction and Narcotics during a 2-day meeting at the Massachusetts General Hospital in Boston, on November 6 and 7. Representatives of pharmaceutical firms, many of which contribute to the Committee's research fund, attended and participated in the discussions.

Assay of analgesic activity in man is complicated by the tremendous influence of suggestion and the difficulty of distinguishing between the subject's awareness of pain and his reaction to it. The same factors, even apart from species differences, make it difficult to predict the clinical value of a drug from the results of experiments on animals. The problem is one of great practical importance, since there is urgent need for more effective and less dangerous pain-relieving drugs, especially those that will not produce addiction.

## ANNUAL MEETING HIGHWAY RESEARCH BOARD

The Highway Research Board, one of the oldest continuing organizations of the National Academy of Sciences–National Research Council, held its Thirty-third Annual Meeting in Washington, D. C., the week of January 11–15. One of the functions of the Board is to serve as a clearinghouse for highway research information. Its annual meetings provide a mechanism whereby engineers and scientists working in a broad field may present their findings and hear them discussed by experts in the field. At this annual meeting more than a thousand highway engineers and administrators, educators, representatives of federal highway agencies, and researchers from allied industries gathered to hear the 122 papers and reports that were given at the 29 open sessions. Sixty-five of the Board's committees and departments held business meetings during the week.

In greeting the delegates on behalf of the Academy–Research Council at the opening session, Detlev W. Bronk, President of the National Academy, challenged the highway researchers to find solutions to the critical transportation problems in urban areas. Further in emphasizing the basic philosophy of the Academy–Research Council, he urged scientists in the highway research field to devote as much of their time as possible to fundamental research.

At technical sessions, which were held in the auditoriums of the National Academy and four nearby buildings, papers were given on a wide variety of subjects of interest to highway men, ranging from economics, administration and traffic problems through highway design, materials, and maintenance, to soils and foundation problems. In line with President Bronk's comments on the need for basic research, one of the Board's committees presented discussions of work on water vapor adsorption in concrete research, the size and shape of gel particles, and the flow of water in hardened cement paste; and, at another session, the results of fundamental research on the theory of the deformation mechanism and bearing strength of bituminous pavements were presented.

The Board's Committee on Night Visibility gave reports on studies of headlight glare and pavement reflections along with a paper on the effect of certain wave length contrasts on discrimination thresholds in mesopic vision. In recent years some of the basic theories of soil behavior in highways have been questioned. Several researches were reported dealing with the relationships of density and moisture content and subgrade soil stability. At other sessions, work was reported dealing with stresses induced in soil masses and the application of the elastic theory to highway embankments.

Those responsible for safety on highways and the efficient movement of traffic presented several papers dealing with these matters. A good bit of thought has been given recently to the human factor in highway accidents, and some of the work in this field was reported before the Traffic and Operations Department of the Board.

The few papers and reports mentioned indicate roughly the broad scope of the activities of the Highway Research Board. These and the many other reports will be published during the coming year by the Board and made available to engineers, administrators, and researchers throughout the United States and in many foreign countries. The dissemination of this information is another of the Board's primary functions.

One of the highlights of the annual meeting is the presentation of awards. This year the Roy W. Crum Distinguished Service Award was conferred upon Prevost Hubbard, formerly chemical engineer with the Asphalt Institute and one of the pioneers of highway research as especially related to bituminous materials, and to Charles R. Waters of the New York State Department of Public Works, an outstanding highway administrator who has been responsible for many important highway researches. The Highway Research Board Award for the outstanding technical paper given at last year's annual meeting was presented to Earl C. Sutherland and Harry D. Cashell of the U. S. Bureau of Public Roads for their paper on "Structural Effects of Heavy-Duty Trailer on Concrete Pavement."

### CONFERENCE ON ARTIFICIAL HIBERNATION

A new type of drug therapy for shock, picturesquely designated as "artificial hibernation" by its French proponents, has aroused interest in military medical circles both because of its new approach to the subject and because it might be applied to American troops in the event of joint operations. On December 9, H. Labroit of France discussed this procedure at a conference held under the chairmanship of Everett I. Evans of the Subcommittee on Trauma. This meeting gave a much clearer picture of the treatment than had been gained from reports previously available and may pave the way for a critical evaluation of its merits by American scientists.

### AMERICAN GEOLOGICAL INSTITUTE

A resolution enabling the American Geological Institute to utilize the processing facilities of the business offices of the member societies was passed at the sixth annual meeting of the Board of Directors held at Toronto, on November 9, 1953. Much of the operational work of the Institute now can be performed elsewhere and the Washington office will devote its energies to assisting committees and handling administrative and policy matters.

The following officers were elected for the coming year: Chester R. Longwell, Yale University, *President;* E. A. Eckhardt, Gulf Research and Development Company, *Vice President;* and Preston E. Cloud, U. S. Geological Survey, *Secretary-Treasurer.*

## *INTERNATIONAL RELATIONS*

### ADVISORY COMMITTEE ON INTERNATIONAL TECHNOLOGIC ASSISTANCE

Harold V. Bozell, Chairman of the Advisory Committee on International Technologic Assistance, has announced the appointment of the following special panel to advise on certain technological and associated problems inherent in the use of glare gas in Saudi Arabia: Harold Osborne, American Telephone and Telegraph Company (ret.), *Chairman;* Robert L. Bateman, Carbide and Carbon Chemical Company; R. B. Wittenberg, General Tire and Rubber Corporation; Harry Curtis, Tennessee Valley Authority; Henry Gardiner Symonds, Tennessee Gas Transmission Company; Terry Duce, Arabian American Oil Company; Everette Lee DeGolyer, consulting geologist; and Joseph Pope, Stone and Webster Engineering Corporation. James A. Barr serves as Project Director and Samuel Manian has been employed as Associate Project Director.

This is the fifth request for advisory technical assistance from the Foreign Operations Administration or its predecessors to come to the National Academy of Sciences–National Research Council since the establishment of the Advisory Committee some two years ago. The former requests concerned the following technological problems: *1*) The construction of a fixed nitrogen fertilizer plant in Pakistan; *2*) a plan for the economic exploitation of the mineral and chemical resources of the Dead Sea; *3*) recommendations concerning the proposed expansion of the synthetic ammonia plant at Sindri, India (later supplemented by two additional requests); and *4*) the establishment of an industrial institute in Lebanon.

The Advisory Committee on International Technological Assistance was appointed by the Chairman of the Division of Engineering and Industrial Research in response to an original request from the Technical Cooperation Administration of the Department of State and is now serving the Foreign Operations Administration. The membership of the Committee is as follows: Harold V. Bozell, General Telephone Company of New York, *Chairman;* William J. Sparks, Division of Chemistry

and Chemical Technology; Thomas H. MacDonald, U. S. Bureau of Public Roads (ret.); Harold Osborne; and Robert M. Gates, Air Heater Corporation of New York. Frederick M. Feiker serves as Technical Director of the Committee.

Upon request, the Advisory Committee reviews with representatives of the Foreign Operations Administration the special problems involved in the request and selects and appoints a special panel of experts whose experience and judgment bear upon the problems. Under their direction staff reports are prepared for final review and approval.

### FULBRIGHT SELECTION UNDERWAY

Preliminary screening of the 1,655 applications for Fulbright lecturing and research awards for 1954–55 in the countries of Western Europe and the Near East has been completed. Of the total number of applications received by the Committee on International Exchange of Persons, 511 or approximately one-third were in the natural sciences.

The majority of the applications in the natural sciences, as well as in other subjects, were for research in the principal countries of Western Europe, including the United Kingdom, France, Italy, and Germany. As a consequence, the competition for awards in these countries has been particularly severe, and it is inevitable that many applicants of high qualifications cannot be accommodated. On the other hand, highly qualified applicants for lecturing appointments for the countries of the Near and Middle East are in a more favorable competitive situation.

All of the applications received by the Committee on International Exchange of Persons in the competition which closed on October 15 were referred for an initial review to screening committees of specialists in the various subject-matter fields. Of the 51 screening committees appointed for this purpose, 14 were in the natural sciences. These included: anthropology; astronomy; plant science; zoology; microbiology, bacteriology, and parasitology; physiology, biochemistry, anatomy, and related subjects; agriculture and related subjects; chemistry; engineering; geology, geography, and geophysics; mathematics; medical sciences; physics; and psychology. The members of each of the screening committees in the natural sciences were nominated by the divisions of the National Research Council primarily concerned.

Of the 1,665 applications received in all fields, 1,275 were recommended by the screening committees for further consideration. The proportion of candidates surviving the initial screening in the natural sciences was approximately the same: 433 out of 511. It is expected that a total of approximately 350 Fulbright grants for lecturing and research in the countries of Europe and the Near East will be made for the academic year 1954–55 and that approximately 100 of these awards will go to candidates in the natural sciences. This estimate indicates that in the natural sciences as well as in other fields approximately one applicant in five is successful, although a much larger proportion of the candidates are considered suitably qualified and would probably be accommodated if a larger number of grants were available.

### EIGHTH PACIFIC SCIENCE CONGRESS

The Eighth Pacific Science Congress and the Fourth Far Eastern Prehistory Congress were held in Manila, November 16–28, 1953, on the campus of the University of the Philippines. Seven hundred delegates from thirty countries and several thousand University students attended the sessions.

The Congress opened with an address on the role of man in science by Vidal A. Tan, President of the University of the Philippines and of the Congress. The Scientific meetings which were held daily included papers on geology and geophysics, meteorology, oceanography, zoology, botany, soil resources, forestry, agriculture, animal improvement, crop improvement, museums, nutrition, social sciences, management and utilization of natural resources, fuels and lubricants, and anthropology. Subjects of special symposia varied from a UNESCO sponsored meeting on marine provinces in the Indo Pacific region to pond fish culture, the ecology of coral atolls, and medicinal plants. Other symposia covered soil classification, dairy production, animal nutrition, plant breeding,

nature protection, land tenure problems, problems of the coconut plantations, volcanology of the Pacific, geologic mapping of the Pacific basin, seismology of the Pacific, cloud physics, typhoon warning procedures, and general circulation in the Pacific. Panel discussions were held on rural public health, malaria, and schistosomiasis.

Evening public lectures given by delegates to the Congress were warmly received by Congress participants and residents of the community. Some of the topics were "Polymorphism in Relation to Evolution," by Julian Huxley (United Kingdom); "Life and Life Conditions of the Deepest Deep-Sea," by Anton Bruun (Denmark); "Hawaiian Volcanoes," by Gordon A. Macdonald (Hawaii); and "Island and Men—Malayo-Polynesian Peoples of Oceania," by Alexander Spoehr (United States).

The forty recommendations adopted by the Congress dealt with such varied subjects as the proposed international geophysical institute in Hawaii, the need for an increase in rainfall recording stations, the reported scarcity of the monkey eating eagle and Tamarao (Mindoro buffalo) in the Philippines, the need for population studies, the importance of nutritional surveys, etc. The post-Congress tours included such points of interest at Hibokhibok volcano, the Ifugao rice terraces at Banave, the Ambuklao hydroelectric project, and a visit to Lucap in the Hundred Islands National Park.

The United States was officially represented at the Manila Congress by delegations appointed by the Department of State and the National Research Council. Attendance of the delegates and of many of the other United States participants was made possible by the generous financial assistance received from the Philippine Government, private foundations, and from agencies of the United States Government.

The Ninth Pacific Science Congress will be held in Bangkok in 1958. In the future, the Pacific Science Association, which sponsors the Congresses, will maintain a small permanent secretariat supported by member countries at the Berenice P. Bishop Museum in Honolulu.

## COMMITTEE ON INTERNATIONAL SCIENTIFIC PUBLICATION

The technical newsletters, which for the past several years have been prepared under the direction of the Committee on International Scientific Publication of the National Research Council and published by the United States Information Service of the Department of State, were discontinued in August 1953. Termination of this project was occasioned by the cancellation of a contract with the Department of State which had supported the work since its initiation soon after World War II.

The Academy–Research Council supported the Committee for three months following termination of the contract, during which time it sought private support for the newsletter project. In November it became apparent that such support could not be obtained promptly and the Governing Board of the Academy–Research Council reluctantly voted to discontinue the activity.

The widespread interest in the newsletters and the hope expressed by many countries that the project be continued have prompted the American Academy of Arts and Sciences in Boston to make further efforts to secure funds to carry on the work. The American Academy has taken over the staff of the former committee and is hopeful that it will soon be able to resume publication of the newsletters. Christina Buechner, who has served as Executive Secretary of the Committee on International Scientific Publication since its formation, is continuing to direct the program under the sponsorship of the American Academy of Arts and Sciences.

## PARTICIPATION IN FORTHCOMING INTERNATIONAL MEETINGS

The United States national committees of the following five international scientific unions, which will hold general assemblies in 1954, have submitted their nominations of persons to serve on delegations to be appointed by the Chairman of the National Research Council: International Mathematical Union, International Union of Crystallography, International Scientific Radio

Union, International Union of Pure and Applied Physics, and the International Union of Geodesy and Geophysics. Appointments will be made shortly and announced in the March–April issue of NEWS REPORT.

In accordance with recent practice, the Chairman of the National Research Council, with the advice of the national committees, recommends to the Secretary of State that an appropriate number of the Academy–Research Council delegates to each of the general assemblies be appointed as United States voting delegates. Individuals selected for such Department of State appointments represent the United States at all sessions of a general assembly at which official member-country action is required. The chairman of the voting delegation also serves as chairman of the Academy–Research Council delegation and is responsible for preparing a report on the meeting for submission to the Department of State. Appointment of United States voting delegations normally is made a month prior to the opening date of an international meeting.

In addition to the five general assemblies of the international scientific unions mentioned above, there will be several other meetings in 1954 at which the United States will be represented. Chief among these are the Eighth International Botanical Congress, Paris, July 2–14; the Fourth General Assembly of the International Union of Theoretical and Applied Mechanics, Brussels, July 27–28; and the International Congress of Mathematicians, Amsterdam, September 2–9.

## FOREIGN RESEARCH SCIENTISTS PROGRAM

The first awards under the Foreign Research Scientists Program, which is supported by the Foreign Operations Administration and administered by the National Academy of Sciences, were made in December 1953. Additional awards will be made during the next few months. A total of approximately 150 young foreign research scientists will receive these awards which will permit them to pursue basic research in American universities for a two-year period.

Candidates for the research fellowship awards are limited to residents of the fourteen countries participating in the Organization for European Economic Cooperation and in which counterpart funds are available (*see* NEWS REPORT, Vol. III, pp. 85–87). Initial selection of these postdoctoral candidates is made by the European academies of science and the applications are then submitted to the National Academy of Sciences in Washington for review and placement.

The following list indicates the field and location of the research of the first nine fellowship recipients:

**From Norway**

Björn Andersen, Quaternary geology—Yale University, with Richard F. Flint.

Rolf Berg, Cytology—University of California, with Katherine Esau.

Glør Mejdell, Chemical kinetics—University of Wisconsin, with O. A. Hougen.

Nicolai Norman, X-ray diffraction—Brooklyn Polytechnic Institute, with P. P. Ewald.

Arne Semb Johansson, Entomology—University of Colorado, with Berta Scharrer.

Erling Strand, Plant breeding—University of Minnesota, with W. M. Myers.

Tore Wessel-Berg, Microwave electronics—Stanford University, with Edward L. Ginzton.

**From the United Kingdom**

Godfrey Newby Lance, Aerodynamics—University of California, with John W. Miles.

Stuart Henry Parker, Physical-organic chemistry—Massachusetts Institute of Technology, with C. Gardner Swain.

## FULBRIGHT OPPORTUNITIES TO BE ANNOUNCED

The 1955–56 competition for Fulbright awards for university lecturing and postdoctoral research in Southeast Asia and the Pacific will be announced early in March. Approximately 80 awards are to be made available for the following countries: Australia, Burma, Ceylon, India, New Zealand, the Philippines, and Thailand. A small program for the Union of South Africa will also be included. Application forms and detailed programs may be obtained after March 1 from the Conference Board of Associated Research Councils, 2101 Constitution Avenue, Washington 25, D. C. Completed applications should be postmarked no later than April 15.

## THE INTERNATIONAL GEOPHYSICAL YEAR

The coordinating group appointed by the United States National Committee for the International Geophysical Year (*see* NEWS REPORT, Vol. III, p. 100) met in Washington, January 14–16 to draft the United States program of participation in the International Geophysical Year and to determine budget requirements. The document produced by the coordinating group, which included members of the National Committee and several university and government scientists engaged in geophysical research, has been transmitted to the Director of the National Science Foundation for review by the National Science Board. Following this review and subsequent examination by the Bureau of the Budget and by agencies involved in implementing the program, plans will be initiated for requesting congressional support.

The next meeting of the United States National Committee is scheduled for April 8 and 9. At this meeting the Committee will approve a United States program for forwarding to the Special Committee for the International Geophysical Year (the international coordinating body) and plan United States participation in the meeting of the Special Committee to be held in Rome, October 1–4.

## ADVISORY COMMITTEE ON ARID ZONE RESEARCH

The Sixth Session of the UNESCO Advisory Committee on Arid Zone Research was held at the University of Montpellier, France, November 3–6, 1953. Among the several recommendations made by this Committee, the following may be of particular interest to readers of NEWS REPORT:

*1*) That the holding of symposia should be continued, that the subject of the symposium for 1956 should be the formation and erosion of soil as affected by climatic factors, and that, if possible, this symposium be held jointly with FAO and WMO.

*2*) That reports be obtained dealing with the following subjects: *a*) the influence of environment on human communities in arid regions and the adaptation of such communities to conditions existing in these regions; *b*) the influence of environment in arid regions on the anatomy, physiology, biochemistry, and pathology of human beings; and *c*) the interaction of animals with their environment in arid regions.

*3*) That the Director General of UNESCO ask the International Association of Hydrology to assume responsibility for the preparation of a code of regulations for the preservation of data and core samples obtained during hydrological surveys.

*4*) That the Seventh Session of the Advisory Committee be held, if possible, in Paris during the first half of May 1954.

*5*) That the symposium on wind and solar energy in arid areas and the Eighth Session of the Advisory Committee be held in India in the autumn of 1954.

The following members of the Advisory Committee were present at the Sixth Session in Montpellier: C. A. Alagöz (Turkey), Alberto Barajas (Mexico), B. T. Dickson (Australia), M. S. Mazloum (Syria), A. Nizery (France), M. S. Thacker (India), and H. G. Thornton (United Kingdom). Gilbert F. White, United States member of the Committee, was unable to attend.

## OFFICE OF INTERNATIONAL RELATIONS

The Policy Committee of the Office of International Relations will meet on February 13 to consider plans for an expanded program to strengthen United States participation in international science. Development of the program, which calls for a coordinated approach by the National Academy of Sciences, the Department of State, and the National Science Foundation on matters concerning United States participation in international scientific activities, has been under way for some time. The February meeting will provide the first opportunity for the Policy Committee as a whole to discuss the various proposals which have been advanced to implement the program.

Membership of the Policy Committee consists of the President and Foreign Secretary of the National Academy of Sciences, the Chairman of the National Research Council, the Director of the National Science Foundation, the Science Adviser in the Department of State and three members-at-large. The Foreign Secretary serves as chairman of the Committee.

### INTERNATIONAL SOCIETY OF CELL BIOLOGY

The Eighth International Congress sponsored by the International Society of Cell Biology will be held in Leiden, The Netherlands, September 1–7. Members of the Society and candidates for membership approved by the International Committee are entitled to attend and to introduce one guest. Professor P. J. Gaillard of the Laboratory for Experimental Histology, University of Leiden, is Chairman of the Dutch Committee which is responsible for Congress arrangements. Correspondence concerning the Congress should be addressed to the Secretary of the Dutch Committee, Dr. W. H. K. Karstens, Botanical Laboratory, State University, Nonnensteig 3, Leiden.

The Congress program, which has been prepared by the International Committee will include symposia on the following topics: Induced enzyme synthesis; the formation of the intracellular matrix in plant and animal tissues; biochemistry of gene action; thyroid secretion; nuclear and chromosome structure; mitochondria; cell division and mitotic poisons; morphogenetic interactions between cells; virus synthesis; the active cell surface; submicroscopic structure of cytoplasm. Speakers will be announced by the Dutch Committee at a later date.

There will be no program of general papers but members and invited guests may contribute a paper to be read by title, if accompanied by an abstract of 300–400 words. These abstracts will be published before the Congress and should be sent as soon as possible to the Secretary of the Dutch Committee.

Officers of the International Society of Cell Biology are: E. Newton Harvey (United States), *President;* J. Runnström (Sweden), *Past President;* E. Fauré-Fremiet (France), Honor B. Fell (Great Britain), and G. C. Herings (The Netherlands), *Vice Presidents;* J. F. Danielli (Great Britain), *Secretary-Treasurer;* and J. S. Nicholas (United States), *Assistant-Treasurer in the U. S. A.* Membership of the International Committee is as follows: T. Caspersson (Sweden), A. Claude (Belgium), C. Estable (Uruguay), P. J. Gaillard (The Netherlands), R. Gautheret (France), F. E. Lehmann (Switzerland), G. Montalenti (Italy), H. Okkels (Denmark), and P. Weiss (United States).

## *RECORD OF MEETINGS*

| November | |
|---|---|
| 3 | Division of Engineering and Industrial Research, Executive Committee |
| | Building Research Advisory Board, Executive Committee |
| | Committee on Tables of Constants and Numerical Data, Nuclear Data Group |
| 3–4 | Committee on Foods, Symposium on Color in Foods, *Chicago* |
| 4 | Building Research Advisory Board |
| | Panel on Malaria |
| | Conference on High Temperature Elastomers |
| 5 | Committee on Plastics and Elastomers, Subcommittee on Elastomers |
| | Committee on Dietary Allowances |
| 6 | Committee on Nuclear Science |
| 6–7 | Food and Nutrition Board |
| | Committee on Drug Addiction and Narcotics, *Boston* |

| November | |
|---|---|
| 8–9 | Board of Directors, American Geological Institute, *Toronto, Canada* |
| 9 | Panel on Sterilization of Blood and Plasma |
| | Ad hoc Panel on Histology of Storage of Polyvinylpyrrolidone (PVP) |
| 10 | Subcommittee on Infectious Diseases and Chemotherapy |
| | Subcommittee on the Nervous System |
| | Advisory Committee, Federal Construction Council, Task Group T–6 |
| 12 | Subcommittee on Shock |
| 12–13 | Building Research Advisory Board, Conference on Porcelain Enamel in the Building Industry |
| 13 | Committee on Plant and Crop Ecology |

**November**

| | |
|---|---|
| 13 | Subcommittee on Food Supply |
| | Committee on Plastics and Elastomers, Subcommittee on Armor and Plastic Compositions |
| 14 | Conference on Criteria of Success in Science |
| | Subcommittee on Waste Disposal |
| | Subcommittee on Water Supply |
| 15 | Committee on Foreign Scholar Selection Program |
| 16 | Subcommittee on Tuberculosis |
| 17 | Climatic Research Committee, Building Research Advisory Board |
| | Committee on Tables of Constants and Numerical Data, Nuclear Data Group |
| | Committee on Chemicals, Subcommittee on Protective Creams |
| 18 | Subcommittee on Stress |
| | Committee on Ship Steel, Project Advisory Committee SR–106 |
| 19 | Subcommittee on the Skeletal System |
| | Annual Meeting, Pacific Science Board, *Manila, P. I.* |
| | Committee on Construction and Use of Precise Globes and Spherical Maps |
| | Panel on Materials for Use at Low Temperatures, Report Committee |
| 20 | Committee on Foods, Subcommittee on Radiation Sterilization, *Chicago* |
| | Institute of Animal Resources |
| | Advisory Committee, Federal Construction Council, Task Group T–5 |
| | Ship Structure Committee, Project Advisory Committee SR–106 |
| 21 | Committee on Psychiatry |
| | Division of Biology and Agriculture, Executive Committee |
| 22 | Agricultural Board–Agricultural Research Institute, Governing Board |
| 23–24 | Agricultural Research Institute |
| 24 | Agricultural Board |
| | Ship Structure Committee |
| | Chemical-Biological Coordination Center, Executive Committee and Sponsors' Representatives |
| | Operating Committee, Federal Construction Council |
| 28 | American Geophysical Union, Executive Committee |
| 28–29 | Committee on Animal Nutrition, *Chicago* |
| 30 | Committee on Medicine and Surgery |

**December**

| | |
|---|---|
| 1 | Committee on Tables of Constants and Numerical Data, Nuclear Data Group |
| | Committee on Codification, Ciphering and Punched-Card Techniques |
| | Committee on Foot Protection |
| | Subcommittee on Animal Reservoirs and Vectors of Disease |
| 3 | Committee on Rigid Pavement Design |
| 4 | Committee on Tables of Constants and Numerical Data |
| | American Geological Institute, Executive Committee |
| 5 | Division of Chemistry and Chemical Technology, Annual Meeting |
| 5–6 | Committee on Growth |
| | Sections and Panels of Committee on Growth |
| 5, 7 | Advisory Committee on Artificial Limbs, Lower Extremity Research and Development Panel, *Berkeley, Calif.* |
| 6 | Committee on Growth, Executive Committee |
| | Governing Board, National Academy of Sciences–National Research Council |
| 7 | Division of Earth Sciences, Executive Committee |
| | Committee on Veterans Medical Problems |
| 7–8 | Advisory Committee D–4, American Society for Testing Materials |
| 9 | Committee on Artificial Hibernation |
| | Food Protection Committee, Industrial Liaison Panel |
| 10 | Committee on Packing, Packaging and Preservation, Symposium on Low Temperature Test Methods and Standards for Containers, *Chicago* |
| | Advisory Committee on Artificial Limbs |
| 10–11 | Panel on Titanium Research |
| 14 | Subcommittee on Personnel and Training |
| 15 | Committee on Sanitary Engineering and Environment |
| | Conference on Maritime Cargo Transportation |
| | Committee on Tables of Constants and Numerical Data, Nuclear Data Group |
| 16–17 | Building Research Advisory Board, Conference on Building Documentation |
| 17–19 | Advisory Committee on Artificial Limbs, Upper Extremity Research and Development Panel |
| 18 | Advisory Committee, Federal Construction Council |
| | Committee on Foods, Subcommittee on Experimental Cookery |
| 18–19 | Committee on Disaster Studies, Ad hoc Panel on Panic |
| 22 | Subcommittee on Shelter and Clothing |
| 30 | Advisory Committee, Federal Construction Council, Task Group T–7 |
| | Pacific Science Board |

# *NEW PUBLICATIONS*

*Annual Review of Nuclear Science.* Vol. 3. Stanford, Calif., Annual Reviews, Inc. 1953. 412 p. $7.00.

*Atoll Research Bulletin.* Nos. 24–26 (bound in one volume). Pacific Science Board, National Academy of Sciences–National Research Council. November 1953. [87] p.

*Bibliography of Genetic Neurology.* Supplement to [Academy–Council] Publication No. 237. 1952. 131 p. $1.00.

*Culvert Hydraulics.* Highway Research Board Research Report No. 15–B. Academy–Council Publication No. 287. 1953. 72 p. $1.05.

*Digest of the Literature on Dielectrics. Vol. XVI. 1952.* Academy–Council Publication No. 285. 1953. 179 p. $3.00.

*Flexible-Pavement Design.* Highway Research Board Bulletin No. 80. Academy–Council Publication No. 282. 1953. 16 p. $0.30.

*Highway Research Organizations. Description of Existing Organizational Patterns and Scope of Activities.* Highway Research Board Special Report No. 15. Academy–Council Publication No. 284. 1953. 44 p. $0.75.

*Hormonal Relationships and Applications in the Production of Meats, Milk, and Eggs.* Academy–Council Publication No. 266. 1953. 54 p. $1.00.

*Pathology of Epidemic Typhus. Report of Fatal Cases Studied by United States of America Typhus Commission in Cairo, Egypt During 1943–1945.* National Research Council, Committee on Pathology in collaboration with Armed Forces Institute of Pathology. Reprinted from *Archives of Pathology*, Vol. 56, pp. 397–435 and 512–553, 1953.

*Present Needs for Research on the Use and Care of Natural Resources.* Academy–Council Publication No. 288. 35 p. $0.50.

*Proceedings of the Thirty-Second Annual Meeting of the Highway Research Board.* Academy–Council Publication No. 271. 1953. 616 p. $8.50.

*Structure and Properties of Solid Surfaces.* Chicago, University of Chicago Press. 1953. 491 p. $8.50.

*Survey of Neurobiology.* Academy–Council Publication No. 237. 1952. 40 p.

*Travel to Commercial Centers.* Highway Research Board Bulletin No. 79. Academy–Council Publication No. 281. 1953. 38 p. $0.60.

*Notice of Academy Meetings*

NATIONAL ACADEMY OF SCIENCES

Annual Meeting, Washington, D. C., April 26-28, 1954
Autumn Meeting, Columbia University, *dates to be announced*

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL

Governing Board, Washington, D. C., February 14, 1954
Governing Board, Washington, D. C., April 25, 1954
Governing Board, Washington, D. C., June 30, 1954

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